

DIVISION OF RESEARCH, INNOVATION & SYSTEM INFORMATION
Research Initial Scope of Work
SUBMITTAL FORM - FY 14/15

- I. Project Number: P927
Project Title: *California Sensitive Amphibian and Reptile Highway Crossings*
- II. Task Number: 2700
Task Title: *Develop roadway crossings for sensitive reptiles*
- III. Project Problem Statement:
Caltrans' mission is to "provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability." This mission includes efficiently delivering quality transportation products and services while preserving and enhancing California's resources and assets. To achieve the mission as well as to meet legal requirements Caltrans is required to mitigate for adverse impacts arising from the construction, maintenance, and operation of the state transportation system to Endangered, Threatened, and other sensitive amphibians and reptiles including those impacts related to wildlife connectivity and habitat fragmentation.

Many reptiles require different habitats and habitat features to meet their breeding, foraging, and over-wintering requirements and to complete their life cycles. These animals need to migrate among the different habitats to maintain their populations and easily traversable road wildlife crossing structures may be needed when roads divide the necessary habitats. Additionally easily traversable road crossings may be necessary for population connectivity to reduce genetic isolation when roads divide sensitive reptile populations from one another.

Caltrans lacks the critical information and guidance necessary to plan, design, construct, and maintain cost effective roadway passages for listed and sensitive reptiles. Without appropriate guidance and designs for these passages, Caltrans is challenged to meet environmental obligations and obtain permits and agreements necessary to construct sustainable highway facilities within desired schedules.

- IV. Objective:
This task will develop information and guidance for Caltrans practitioners for locating, designing, constructing, and maintaining cost effective roadway wildlife linkages and crossings for selected reptile taxa that need to cross highways to reach suitable habitats or maintain genetic diversity and population viability. In this call for submissions, wildlife crossing structure is defined as a box culvert, corrugated metal pipe, bridge, or other underpass structure that may be utilized by reptiles and other wildlife for movement under a roadway.

V. Task Description of Work and Expected Deliverables:

The objective of this task will be met via the following:

- In consultation with Caltrans and regulatory agencies, develop a prioritized list of listed and sensitive California reptiles that can be impacted by roads and which may need roadway crossing structures to maintain and enhance populations. Caltrans has a draft tentative list for potential consideration. The taxa on this list include: coast horned lizard, blunt nosed leopard lizard, southern rubber boa, rosy boa, ring-necked snake, California mountain kingsnake, giant garter snake, San Francisco garter snake, western pond turtle, and desert tortoise.
- Develop information for locating, designing, constructing, and maintaining roadway wildlife crossing structures for the selected sensitive California reptile taxa. Specifics to be studied should include but are not limited to: crossing dimensions (height, width, and length), crossing shape, materials and spacing between structures; light, temperature, and humidity conditions within crossings; fence materials, mesh size and height; and the integration of wildlife fencing and roadway wildlife crossing structures.
- Develop and test reptile wildlife crossing structure designs and materials for listed and sensitive California taxa specifically considering fence and crossing details.
- In consultation with Caltrans and regulatory agencies, identify existing or proposed Caltrans District projects as study sites to study and monitor the effectiveness of various reptile crossing designs.
- Study the effectiveness of median barriers designed with scuppers as a crossing feature for reptiles.
- Develop guidance materials for locating, designing, constructing, and maintaining roadway passages for the selected reptiles for use by Caltrans and other transportation practitioners.
- Develop a training session for Caltrans practitioners and other interested people detailing the results of the research and discussing how to use the guidance materials to design wildlife crossing structures for reptiles.

The expected deliverables for this task are:

- A prioritized list of listed and sensitive reptiles to be considered for wildlife crossing structures.
- A research report providing detailed information for locating, designing, constructing and maintaining wildlife crossing structures for the sensitive reptiles.
- A research report detailing the study design, methods, and results of data collection and monitoring of wildlife crossing designs for sensitive reptiles.
- Guidance materials that can be used by Caltrans practitioners for locating, designing, constructing and maintaining wildlife crossing structures for the sensitive reptiles.
- A training session via the web to Caltrans practitioners and other interested people presenting the results of the research and how to use the guidance

materials to locate, design, construct and maintain wildlife crossing structures for identified reptile taxa.

VI. Background:

Caltrans lacks the critical information necessary to plan, design and construct cost effective wildlife crossing structures for Endangered, Threatened, and other sensitive reptiles and amphibians. More than 25 amphibian and reptile species are listed as threatened or endangered in California. Additionally, many more taxa are considered to be sensitive by agencies such as the California Department of Fish and Wildlife, United States Bureau of Land Management, and the United States Forest Service. Roadways pose movement barriers for many of these taxa and are also a source of other negative impacts including habitat loss, soil and hydrological ground disturbance, mortality and pollutant runoff. As California's human population increases and climate changes, additional stress will be placed on existing amphibian and reptile populations. Without consensus on appropriate wildlife crossing structure guidance and designs for these taxa, Caltrans is challenged to meet environmental obligations and obtain permits and agreements necessary to construct sustainable highway projects within desired schedules. This project will develop information for Caltrans practitioners to locate, design, construct, and maintain cost effective highway crossings for these animals that meet the requirements of regulatory agencies.

VII. Estimate of Duration: Present to June 30, 2019

VIII. Related Research:

Caltrans has performed two preliminary investigations to provide a basic synthesis of the literature and the practice pertaining to amphibian and reptile wildlife crossing structures crossing roadways:

California Amphibian and Reptile Crossing Preliminary Investigation July 2013

http://www.dot.ca.gov/research/researchreports/preliminary_investigations/docs/california_amphibian_reptile_crossing_preliminary_investigation.pdf

Highway Crossings for Herptiles (Reptiles and Amphibians) November 2012

http://www.dot.ca.gov/research/researchreports/preliminary_investigations/docs/herptile_highway_crossings_pi2012-11-2.pdf

These Preliminary Investigations identified a number of nationally recognized highway issues relating to reptiles and amphibians and recognized that impacts and crossing requirements are often species or region specific. Several states particularly New York and Florida have performed research on amphibian and reptile crossings and much European work also exists. Additionally, the investigations determined that for many sensitive California taxa sufficient information does not exist to properly construct highway crossings.

Another task in this project is being done concurrently with this task. This additional task is: *Task 2666 Develop roadway crossings for sensitive amphibians.* Additionally, the Caltrans Division of Environmental analysis is pursuing a contract to standardize plans for wildlife crossings.

IX. Deployment Potential:

This project is being managed by the Division of Research, Innovation, and System Information and is sponsored by the Caltrans Division of Environmental Analysis. The eventual deployable product is envisioned to be information that can be used to help locate, design, construct, operate, and maintain wildlife crossing structures for reptiles.

X. Author: Harold Hunt

Date: June 11, 2014